

## TOPICS IN EDUCATION

## 2 On Running a Summer School

by

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Hills Road, CambridgeWould-be organizers of summer schools are offered some advice on  
how to increase the efficiency of communication between participants.

THE sort of "summer" school I have in mind can occur at any time of the year, lasts for any period from a few days to two or three weeks (the commonest time is one week), consists wholly of lectures and discussions, without practical classes, and is attended by anything from fifty to a few hundred postgraduate or postdoctoral students. There may be some older people from adjacent fields, or some who want to change their field entirely, but most of the audience will already have had a grounding in at least a part of the subject to be covered. My own experience has been limited to schools in molecular biology. I have not been to many of these, but I have noticed that they all have certain problems in common. With a little care some of these difficulties could be avoided.

All the schools I have attended have coped very well with the more obvious problems of organization. They have been held in pleasant places, for everybody knows that scientists are reluctant to go to meetings unless they are held half way up Mont Blanc, or on a Greek island, or in some similar place. (I notice that scientists have not yet achieved a really peak position in our affluent society. If they meet in expensive places, they do so slightly out of season, when the rates are appreciably cheaper.) The mechanics of housing people, getting them to and from the airport or the railway station, the arrangement of the lecture room and other such matters are usually done rather well. And, although I have not been privy to the financial side, the lecturers have been tempted with a modest honorarium in addition to their expenses, and many of the students assisted with grants from one source or another. Of course, there can be hazards even here. One organizer told me that they had omitted to ask, on the application form, for the sex of the applicants, thinking that they could deduce this from the first name (the students were sharing two to a room), but they were stumped in several cases by such names as Leslie. Another organizer told me that for their meeting they had fortunately remembered to put the entry "sex" on the application form. "Of course," he said, "a few people came up with the old joke, and simply put 'yes', but they always turned out to be male."

Nor have the difficulties come because the lecturers were inexperienced. It is not generally realized by the world at large just how accustomed scientists are to talking for fifty minutes, at least by the time they are in mid-career. It is possible for a novelist to win the Nobel Prize for Literature without ever having made a public speech, but I doubt if any comparable scientific figure could be inexperienced in this way. Even a taciturn scientist can often give a good lecture. Moreover, scientists nowadays mix fairly easily, because, contrary to popular belief, scientific research is often a rather gregarious activity, unlike writing, which is usually rather solitary. Of course, some scientists give poor lectures, but they are unlikely to be asked to speak at summer schools.

The organizers usually make it quite clear in their advertisements what the course will cover, but they often omit to say at what level it will be given and exactly what background is expected of the student. It is well worth considering whether the first few lectures should not be entirely introductory, to bring everybody up to the same level. This is especially important for new subjects which fall between two already established ones.

In such cases the initial lectures might be run in parallel. For example, if the summer school is designed to lure recruits to the new and fascinating field of, say, astrobotany, then the astronomers might get an introductory day on botany, while at the same time the botanists could be brushed up on the solar system and the structure of the galaxy. At the very least one or two suitable textbooks could be indicated, the contents of which the students were supposed to master beforehand, though whether in fact they would do this only experience can show.

This uncertainty about background also affects the speakers, for, curiously enough, the organizers often fail to brief the speakers on this point. I have heard a really excellent lecture given on "work in progress in my lab" when what I thought the audience needed was a broad review of the field. The organizers, because they select the students, usually know a fair amount about their background, but this useful information they often keep to themselves. Sometimes they volunteer it after the lecturers have arrived, but this is usually too late for the lecturers to alter their talks very much, if only because they may not have brought the right slides. For all I know the organizers of the meetings I attended may have considered all these points but have decided that old so-and-so will always give the same lecture, no matter what he is asked to talk about, or, alternatively, that it doesn't matter what he talks about because the students never really understand it, although he makes it all sound fascinating. But I believe most lecturers would welcome a little guidance from the organizers and would in most cases adjust their lectures to meet the occasion.

A much more difficult point concerns written lecture notes. Most lecturers nowadays have so many calls on their time that they will not accept an invitation to a summer school if they are expected to provide a manuscript for publication. Of course, the organizers may try to bribe them with a very large honorarium (to be paid when the manuscript is delivered!), but this is expensive and even then will not always work. One school I attended taped all the lectures. From these tapes one of the organizers made lengthy summaries, which were then mimeographed by a very efficient secretarial staff and distributed to the students, but this puts a very heavy strain on the persons concerned and inevitably rather a lot of mistakes creep in. (Nevertheless, Volker Kasche and his colleagues (see footnote, page 1276) consider that these summaries were very valuable and strongly recommend that such papers be prepared in future courses.)

On the other hand, if nothing is provided the students may have a very hard time taking useful notes. A good compromise is to persuade the lecturers to provide an outline or a summary, together with a few key references (too many is worse than too few). This could even be done after the lecturer had arrived, though it is obviously better to have the summaries available before the lecture is delivered. Most speakers lecture from notes and it is not a great deal of trouble to transform these into an outline of the lecture, provided no attempt is made to adapt such notes for more formal publication. (The difficulties which this produces have been discussed by Bragg<sup>1</sup>.)

The principal fault, however, of almost all schools is not the quality of the lectures but the quantity. One organizer of a school admitted to me that they had too many speakers. "We asked a few more than we needed," he told me, "feeling certain that one or two would refuse, but to our surprise they all accepted!" Whatever the reason the organizers almost always arrange too many lectures for the time available. At one time I thought that my fatigue was just another distressing symptom of my advancing years, but I have made enquiries among my younger colleagues and (with only one exception) they have all complained that before the end of the meeting they were satiated and could no longer take things in. Most organizers know that they should leave at least part of the day completely free ("for discussion", they usually say, but a walk or a swim would be better). Even so, they often manage to programme as much as six or seven hours of lectures a day. I think this is too much (except perhaps for a meeting lasting only one day) though what the optimum is I am not sure. I suspect four hours of listening a day is enough, plus perhaps an hour or so for informal discussion. Moreover, even at this rate, if the meeting lasts any time at all there should be complete days (or half-days) left free, at about the rate of one day off for every three or four days on. The wise organizer would even arrange more free time than this, to allow for the demand, which usually arises if the school is a good one, for "a little extra meeting this afternoon to hear about such-and-such". It is these little extra meetings, like those little extra drinks, which are really killing. I would very much like to know the opinions of students on their powers of assimilation. Good data on this would be invaluable to the organizers of all sorts of meetings. I am assuming here that the school is such that almost all the students will want to attend all the lectures.

It follows that because the total time available for the school is usually fixed in advance the organizers must resist the temptation to try to cover too much, and must design the content of the programme with great care. Experience shows that this is more easily said than done.

But suppose that the organizers have solved all these problems, that the students have all acquired a suitable background, that the lecturers, being well briefed, have all delivered model lectures and that the programme is well chosen and not overcrowded.

There is one outstanding problem—the discussion; or, in more general terms, the reciprocal interaction between lecturer and student. There should always be some discussion in the lecture room at the end of each lecture or groups of lectures. Sometimes the students are shy and the questions get asked only by the other lecturers. They have usually heard the lecture several times already in other parts of the world, but out of politeness they may ask leading questions, or even occasionally attack the speaker. Such a conflict is not necessarily a bad thing. I have noticed that students like nothing better than seeing a couple of established workers going at each other hammer and tongs, provided it is done with good humour. But if, as the meeting goes on, the students themselves are not asking the questions, something is wrong.

And this brings me to the informal discussion. Students want very much to be able to meet the speakers, not only to ask them the more technical questions, but also to get some impression of the way their minds work. This cannot be done merely by having the lecturers and students eat together, because the audience for each speaker is then too small and too frozen. Someone down the table, who desperately wants to hear some topic discussed, may be just too far away.

An excellent solution, used by one school I attended, was to make the morning's speakers available, after lunch, on the terrace when coffee was being served. A small group would form round each speaker (sometimes round a pair of speakers) and the questioning could go on for perhaps an hour or so. Nobody (except the lecturers!) was

compelled to stay and eventually the talk would gradually fade away. The amount of ground covered in this way can be astonishing. Not only can misunderstandings be quickly cleared up, but much detailed technical information can be conveyed rather rapidly to the more advanced students. Moreover, nothing removes the students' shyness so quickly, and this will usually solve the difficulty of getting a good discussion immediately after the lectures and also give them enough courage to talk freely to the lecturers when they come across them at meals or in the bar. Such conversations can be invaluable to the students. For this reason lecturers should always be encouraged to stay at the school for as long as possible, preferably for all of the time if they can spare it. They will find that if they do so the students will be very appreciative. Whether they should be expected to listen to all the other lecturers is another matter!

Such informal contacts also allow the lecturers and the organizers to get some impression as to how the school is going, but I suspect that if one really wants to know what the students feel some more organized feed-back is necessary. I would suggest that something along the following lines might be tried. Let the students be put into groups of ten or a dozen, each with a spokesman. The groups, as far as possible, should be homogeneous. Either all botanists, or all Frenchmen, or all postdocs, or, better still, all three. The spokesmen should be articulate and liked by their fellows. Each day the groups should meet informally for a few minutes (no need to spend too much time on it) and discuss their reactions to the lectures of the day and the way the school is going. Then the group leaders and the organizers should meet collectively (again, for a brief period) to pass on this information. Lecturers, as far as possible, should not be included, so that everybody can be frank! Even if this is not done every day, it should be done at least soon after the start of the course and again at the end. It would not be a bad thing if, after the course, students were asked to comment on it in writing if they felt they had something useful to say\*. It seems to me that without this kind of feed-back it is going to be impossible to improve the organization of summer schools.

Finally, I should like to make a personal plea to the organizers on two minor points. It really does help to have name tags (and legible name tags that one can read without peering) together with a list of the names and addresses of all lecturers and students. This is usually quite easy to compile because the organizers have all the data passing through their hands. The other point concerns the social life. A good school has a convenient bar, where people can relax over drinks and in some schools dances are organized or trips to see the local night life. Personally, I love dancing in rather dimly lit cellars, but I find that I cannot stay up till all hours of the morning and be fresh and receptive next day. Age again, you will say, but I believe that only the very young can do this. It makes life much less of a strain if the late nights are organized on the evenings before a totally free morning. I know this sounds elementary, but it never seems to happen.

Looking back on what I have written, I see that my chief theme has been efficient communication. Research workers are quite experienced at communicating with other research workers. If they teach, they acquire, over the years, some experience in instructing a recurrent set of undergraduates. But the summer school is often a one-shot teaching situation, involving rather more sophisticated students. If we are to become professional at it, and not just play it by ear in an amateur fashion, we must take special steps to see that this communication of knowledge, experience and enthusiasm is both efficient and enjoyable.

\* This was done at one school I attended. A group of Swedish students, headed by Volker Kasche, produced a very valuable critique of the school. They particularly stressed the advantages of having a high lecturer/student ratio. I should like to thank them for making their comments available to me.

<sup>1</sup> Bragg, L., *Science*, 154, 1613 (1966).